ERDP's SEMP

Ecosystem Management Project

The SEMP Site Index

Working toward the definition of a uniform measure of site condition

June-Sept 2002

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Background

- "High" "Medium" and "Low" impact/disturbance categories show unacceptable overlap
- In 2002 -
  - Agreement reached that no single measure would be adequate
  - TAC developed criteria for a measurement scale
  - Using these criteria, team leaders identified elements which showed most likelihood to reflect condition
  - Eight candidate factors proposed as reasonable for "plot" level rankings
  - "Landscape" level factors agreed to need further development
- Workshop scheduled for 30 Oct to agree on plan to implement
- All sites to be classified using index plan in FY03

Objectives of TAC Conference Call*

"To provide guidance in developing:"

A) a set of criteria that will be used to choose parameters for site condition

B) a verification process to ensure that the designations of disturbance categories are consistent with the current understanding of training activities by installation personnel

C) a slate of candidate parameters (e.g., surface cover, soil compaction, microflora populations)

D) preliminary quantification for each parameters to designate the disturbance categories (high, med. low).

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TAC Criteria for Indicators*

(following 06/12 Conference Call)

- **1) A parameter must be currently measured, measurable, or knowable.**
- **2) A parameter must be related to anthropogenic activity (e.g., military operations), environmental patterns, processes, and events, or both.**
- **3) Obtaining and analyzing the parameter must be cost effective, with consideration given to use of the parameter for both current and future potential sites..**
- **4) A parameter must be transferable to other projects and other installations.**

  5) The set of parameters needs to apply to both terrestrial and aquatic systems.
- **6) The set of parameters needs to apply to multiple scales (spatial and temporal).**

  7) The set of parameters needs to reflect historical legacies (i.e., the range of pre-military use to current use, at least to the extent that we know it.

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TAC Candidate Elements*

(following 06/12 Conference Call)

- **1. Vegetation structure (i.e., vertical layer, as well as horizontal distribution) and composition of communities by ecological group (as defined in Fort Benning's INRMP)**
- **2. Soil compaction (may correlate with changes in soil horizon profile)**
- **3. Microfloral populations (applies to both terrestrial and aquatic systems)**
- **4. Plant productivity (applies to both terrestrial and aquatic systems)**
- **5. Soil and sediment carbon**
- **6. Plant (Raunkier) life form for communities**
- **7. Historical land use and current road/trail networks? (both qualitative and quantitative)**
- **8. Remotely-sensed surface cover by ecological group**

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Consensus Policy Statement*

"Rather than identifying site condition categories as high, medium or low, site condition parameters will be mapped across a continuum created from the entire set of parameters. This enables a quantifiable method for comparing study sites. The actual range of values for each parameter and their measurement will be discussed after initial feedback from researchers is appraised."

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Development Process

- Team Leaders asked to review TAC memo
- Propose additional candidate parameters
  - Several were proposed
- Team Leader-Project Manager conference call
- Distributed spreadsheet with potential parameters – now 13 in all, with added candidates
- Team Leaders ranked parameters on 1-5 scale
- Seven ranked at >3.75 appeared highest value

Candidate Parameters
(after added elements from research teams)

1. Vegetation Structure
2. Soil Compaction (bulk density)
3. Microflora
4. Plant Productivity
5. Soil/sediment Carbon
6. Raunkiaer Life Form
7. Historical Land Use
8. Surface cover (via RS)
9. A-Horizon Soil Depth
10. Nutrient Leakage
11. Ant Community Structure
12. Species Composition
13. Soil/Sediment Nitrogen

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Rank of Elements after TL Inputs

Element	Score
A-Horizon Soil Depth	4.8
Soil/sediment Carbon	4.6
Soil Compaction (bulk density)	4.4
Vegetation Structure	4
Species Composition	4
Historical Land Use	3.8
Soil/Sediment Nitrogen	3.75
Plant Productivity	3.6
Surface cover (via RS)	3.2
Microflora	2.4
Nutrient Leakage	2.4
Ant Community Structure	

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Preliminary Index Agreement

- **Decision to use only 5 parameters initially**
- **Soil N was moved up since most analyses provide C/N in single step**
- **Surface and canopy cover added as simple and relevant**
- **New “Draft Site Index Parameters” had 8 elements**
- **Project Leader distributed possible form of index**
- **Conference call reviewed, and further simplification proposed for first attempt**
  - Agreement to use values rather than classes for some items
- **Workshop scheduled for 10/30 to resolve some remaining questions**

Initial Site Index
(as proposed 09/02)

Factor	Values	Comments and Discussion
Canopy Cover	+	Densiometer readings in deciles (25% cover=third decile)
Ground Cover	+	Estimate of per-cent cover by deciles
A-horizon Depth	+	Per-cent of local/regional maximum in deciles. Maxima TBD
Soil Carbon[2]	+	Per-cent of local/regional maximum in deciles. Maxima TBD
Soil Nitrogen[3]	+	Per-cent of local/regional maximum in deciles. Maxima TBD
Permitted Land Use Military	--	*Initially*, 0.2 if no tracked vehicle usage permitted; 0.7 if permitted. Will be fine tuned with better data later.
Permitted Land Use Forestry	--	*Initially*, 0.1 if no evident forest practices; 0.3 if only controlled burns noted; 0.6 if thinning noted; 0.8 if recent final harvest
Bulk Density	--	Per-cent of local/regional minimum-maximum range in deciles. Applicable range TBD